

Ontario Initiatives in Pollution Prevention



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Environmental Partnerships Branch
Ministry of the Environment



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Why pollution prevention?

Ontario is committed to pollution prevention, and it's easy to see why. Anticipating and preventing pollution from toxic chemicals and industrial wastes offers significant advantages over traditional end-of-pipe environmental control techniques. Prevention not only does a better job of protecting our environment, but as our partners in industry have shown time and again, it also provides opportunities to improve operating efficiency, significantly reduce costs, lessen environmental risk and limit liability. And the list of successes achieved to date by Ontario's companies, organizations and governments is an impressive one.



Introduction

Traditionally, environment ministries have taken the role of regulator, setting and enforcing environmental standards. Pure 'command and control', however, is not always the most effective approach to environmental protection.

One of the best strategies for meeting Ontario's environmental goals is to encourage continuous improvement to reduce or eliminate pollutants or wastes at the source—in short—pollution prevention. In order to make pollution prevention a basic part of doing business across the province, the Ontario Government has rolled out its initiatives along four strategic tracks:

Pollution Prevention Partnerships

- ◆ The Ministry of the Environment initiates Memorandums of Understanding and other forms of innovative partnerships with industrial associations, private companies, environmental organizations, municipalities and other government agencies

The Pollution Prevention Pledge Program

- ◆ This innovative program encourages the adoption of pollution prevention measures and rewards the successes of industrial, commercial, institutional, community and government enterprises

Education and Training Support

- ◆ The ministry develops and

delivers training and educational programs, including videos, guidebooks, environmental management systems, case studies and codes of management practice.

Leadership initiatives

- ◆ The ministry has also been actively involved in helping industrial, commercial, institutional and municipal partners establish and manage many different pollution prevention initiatives.

This report outlines the ministry's activities on each of these four fronts and provides an overview of the progress achieved. Thousands of tonnes of pollutants have been kept out of the environment and millions of dollars have been saved.

Credit for this impressive pollution prevention momentum goes in large part to the many industries, commercial enterprises, municipalities, non-governmental organizations and institutions who have embraced pollution prevention in their own operations. They have joined the ministry as pollution prevention ambassadors

What has been achieved through pollution prevention partnerships and leadership initiatives so far is wonderful news for the environment, for the economy and for the people of Ontario. We are determined to continue building on this achievement.

1. Pollution prevention partnerships

Pollution Prevention Partnerships involve formal or informal agreements between government and the industrial, commercial and municipal sectors, giving structure and recognition to individual voluntary pollution prevention efforts. Under these agreements, pollution prevention planning and environmental management systems are incorporated into business plans, resulting in reductions in wastes generated and toxic substances released into the environment. These partnerships also serve to enhance awareness of pollution prevention in industry and society at large.

To date, formal Memorandums of Understanding (MOUs) have been developed with five industrial sectors as well as the City of Hamilton. Cumulative reductions achieved through these agreements, and the number of case studies reported annually, are presented in the accompanying table.

Less formal partnerships have also been developed with several other sectors and organizations. These differ from MOUs in that (1) they are not delivered through formalized agreements, and (2) pollution prevention planning may be only one of several objectives of the partnership – others could include worker health and safety.

Current Partnership Agreements include, for example, those with

the Emery Creek Environmental Association, and with the Hamilton District Autobody Repair Association.

Total reductions and case studies reported through Pollution Prevention Partnerships (MOUs)

Sector	Number of case studies in 1998	Cumulative reduction (tonnes)
Automotive Parts	20	1,170
Chemical Producers	11	12,000
Metal Finishing	5	2,270
Motor Vehicle Manufacturing	28	334,600
Printing and Graphics	7	630
Total reductions		350,670

Memorandums of Understanding

The following are brief outlines of the current state of the Memorandums of Understanding developed with five industrial sectors and one municipality. These MOUs have resulted in publicly reported reductions through case studies, as well as the development of pollution prevention planning models and implementation strategies that can be used by other sectors and municipalities.

Auto parts manufacturing

The Auto Parts Manufacturers' Association (APMA) and the Canadian and Ontario governments

By May 2000, the ministry's pollution prevention programs, including MOUs and the Pollution Prevention Pledge Program had achieved a total reduction of 400,000 tonnes of toxic substances and wastes, beyond compliance, exceeding the original goal of 386,000 tonnes from 1992 levels by the year 2010.

Chromic Acid Reduction

A.G. Simpson Co. Ltd. stamps various automotive products. The company developed a system to make common use of three plating line solutions, reducing its requirements for chromic acid plating solution.

Through this program, 143,000 kg/yr of chrome bearing waste and 100,000 kg/yr of sulphuric acid were eliminated. Other results included improved employee health and safety and reduced costs. The capital investment for the equipment change was \$650,000, and the return on the investment is expected to be savings of \$1 million a year.

Waterloo Furniture Components (WFC)

WFC, a signatory of the Metal Finishing Industry MOU, is a Canadian manufacturer of components for office furniture. WFC initiated a pollution prevention project to eliminate the use of acetic acid, ammonium chloride and o-Chlorobenzaldehyde (OCB), all of which are highly hazardous and result in metal in effluent. The company was able to find less hazardous alternatives to all three chemicals, resulting in the total elimination of OCB, ammonium chloride (3,288 kg/yr) and acetic acid (4,180 gal/yr).

are working on a new performance-based MOU. The goals are to share information among members through the development of sector guides and to promote the principles of pollution prevention and environmental management systems (EMS) through the delivery of information and the organizing of training workshops. The association worked in partnership with the ministry, the Canadian Standards Association and Proctor & Redfern Ltd. to develop an ISO 14000 Implementation Guide specifically targeted to automotive parts manufacturing.

In 1998, the Third APMA MOU Progress Report was released. This report profiles 20 case studies contributed by five member companies and accounting for reductions totalling more than 1,100 tonnes.

Chemical production

The national office of the Canadian Chemical Producers Association, Environment Canada and the MOE have developed an MOU and Annex on the reduction of emissions of volatile organic compounds (VOCs) from chemical plants. The MOU will contribute to the Ontario Anti-Smog Action Plan target of a 45 per cent reduction in VOCs by 2015. The draft MOU and associated facility information are posted on the CCPA Web site (www.ccpa.ca).

City of Hamilton

The City of Hamilton has developed and implemented a

pollution prevention plan for its municipal activities, and in doing so has completed its obligations set out under the MOU with Environment Canada and the Ministry of the Environment. The municipality is now going beyond the terms of the original agreement by developing an environmental management system.

Metal finishing

The MOU with the Metal Finishing Industry, originally signed in 1993 and updated in 1999, has 25 company signatories.

The Sixth Progress Report, published in the fall of 1999, contains 36 case studies detailing pollution prevention plans that have yielded a total reduction of 5,288 kilograms a year in chemicals, metals and materials.

A training course based on the Metal Finishing Pollution Prevention Guide was developed by Water Technology International and Sheridan College, and presented in April, 1999. More than 90 staff members from 35 organizations completed the pollution prevention training. On September 23, 1998, the Metal Finishing Pollution Prevention Task Force hosted the Fifth Progress Review and Workshop Meeting. Forty-six people attended, representing metal finishing associations and companies, their suppliers and governments.

In 1998, the project was presented to metal finishing groups from Argentina and the Philippines. In April 1999 it was

presented at a workshop in Taiwan that was attended by more than 100 Taiwanese participants.

In 1997 a Pollution Prevention Award was given to Kuntz Electroplating Inc. for developing nickel recycling alternatives for waste nickel sludge. In 1998 the award was given to Spectra Anodizing for reuse and recovery of phosphoric acid, a co-product in an anodizing line. The 1999 award winner is Torcad Ltd., which has completed several successful pollution prevention projects.

Printing and graphics

Participants in the MOU have continued to provide education and awareness training and technical assistance to printers through site visits, workshops and seminars and the continuing development of the Web site pollution prevention for Printers (www.cleanprint.org). The MOU Agreement was renewed to 2001, and it is posted on the Environmental Bill of Rights Web site (www.ene.gov.on.ca/envision/env_reg/ebrr/).

In 1999, the Third Progress Report was published, highlighting seven case studies and demonstrating a reduction of 210 tonnes of toxic substances and other contaminants from Ontario-based facilities.

The Canadian Vehicle Manufacturers' Association (CVMA) Project

The Canadian Automotive Manufacturing Pollution Prevention Project or CVMA Pollution Prevention Project is the first and longest-running voluntary pollution prevention agreement in Canada between government and industry. It came into effect with the signing of a Memorandum of Understanding (MOU) on May 29, 1992. Since then, successive MOUs were signed, each building on the achievements of previous agreements.

The goal of the CVMA Pollution Prevention Project is to produce a verifiable reduction in the amount of persistent toxic substances as well as other environmental contaminants of concern that are used, generated or released by the participating members of the CVMA.

To date, 7 progress reports have featured 138 innovative pollution prevention case studies accounting for reductions and/or elimination of over 9,400 tonnes of listed targeted substances and more than 400,000 tonnes of other substances and wastes.

Outreach activities have included four pollution prevention workshops for suppliers and the use of environmental management systems to further reduce toxic substances in their operations. Suppliers are integral to the achievement of the CVMA

Beacon Herald Fine Printing Ltd.

Beacon Herald Fine Printing Ltd., a full service printing company, recently set an objective of eliminating isopropyl alcohol from its press dampening solution to reduce emissions of VOCs, which contribute to smog.

Various alcohol substitutes were evaluated, with the assistance of the alcohol substitute vendor. Beacon now operates completely alcohol-free on all printing presses. This change was achieved with no capital investment, yielded a savings of \$2,100 a year and eliminated 1,636 kilograms of VOCs.

Life Cycle Management

Life Cycle Management is a philosophy that business decisions should take into consideration both the financial and environmental costs associated with a product throughout its life – from the acquisition and use of raw materials for its manufacture to the long-term costs associated with its disposal. Acceptance of LCM acknowledges the importance of pollution prevention and often leads to a reduction or elimination of the need for end-of-pipe controls.

Reductions in Use of Paint Purge

General Motors of Canada Limited – Oshawa Autoplex – Truck Assembly Centre

The Oshawa Autoplex is the largest North American automotive facility. The Truck Assembly Centre builds a total of 1,300 Chevrolet and GMC pickups per day.

In 1996, the truck plant implemented a Chemicals Management Program utilizing a single vendor to manage the supply of most indirect chemicals.

Chemical Managers were assigned to search out and implement more efficient uses of chemicals throughout Autoplex and to reduce the per-vehicle cost of chemical requirements. The Chemical Managers in conjunction with Truck Plant Paint Shop personnel were able to implement numerous changes including a reduction in purge frequency, enhanced air/solvent purging, reductions in the number and length of lines requiring purging and an increased capture rate for the purge.

Through the minimization of purge solvent usage, the truck plant has reduced its emissions of VOCs by 540 tonnes per year. The plant is now exploring further pollution prevention opportunities under the Chemical Management Program.

Pollution Prevention Project goals.

Further, there have been enhanced proactive communications with the public and interested stakeholders by showing pollution prevention efforts at the plants. Three site visits provided opportunities for discussion and input into the project from a diverse range of environmental organizations, labour groups, and other interested parties.

Continuous improvement is embedded in the CVMA Pollution Prevention Project's philosophy. Since the onset of the Project, the list of targeted substances has been continuously updated so that it remains consistent with government programs.

2. The Pollution Prevention Pledge Program

The Pollution Prevention Pledge Program is a recognition and incentive program that encourages the adoption of pollution prevention and pollution prevention planning by industrial, commercial, institutional and government participants. Recognition is given to companies that have achieved reductions in the use, generation and/or release of hazardous wastes and industrial effluents.

Facilities registered at the P² level (making a public reduction pledge) or at the P³ or P⁴ levels (achieving reductions) will receive Pollution Prevention Certificates acknowledging their participation. Exemplary projects may be eligible to win one of the ministry's annual Awards of Excellence.

To date, over 150 facilities across Ontario have enrolled at the level P² or higher, and they illustrate the program's broad scope throughout Ontario's economy and the various spheres of environmental concern. Total reductions reported through the program are currently greater than 52,000 tonnes per year (see graph).

Levels of participation

The Pollution Prevention Pledge Program offers industry, business and institutions, including government, four progressive levels of participation:

P¹

Registration and planning level: for facilities intending to make a commitment to eliminate or reduce pollution.

P²

Reduction commitment pledge level: for companies that are ready to make a targeted, public commitment to reduce pollution.

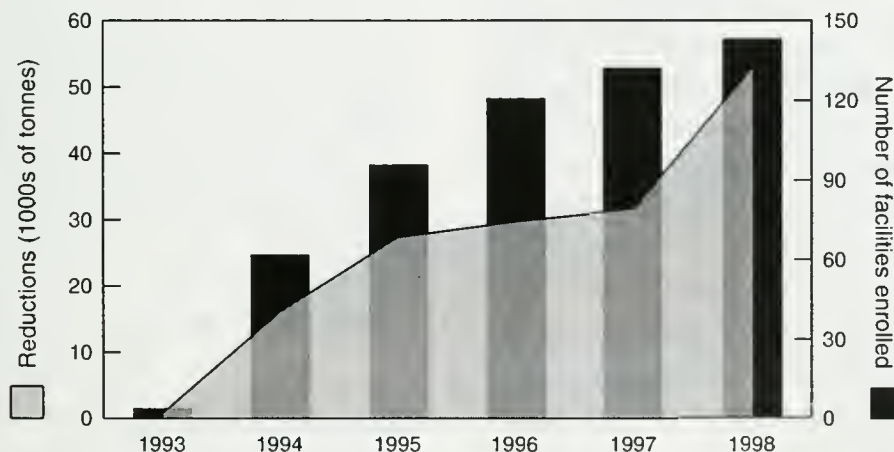
P³

Reduction achievement level: for facilities that have achieved a considerable reduction in pollution or have made significant progress toward their goals.

P⁴

Pollution prevention achievement level: for facilities that have achieved considerable reductions or have made significant progress toward their goals and are using accepted pollution prevention techniques in their production processes.

Total participation and reductions reported in the Pledge Program



Annual award winners



The following companies and organizations have been honoured with Achievement Awards under the Pollution Prevention Pledge Program:

1993

◆ Small facility:

Ontario Store Fixtures (Concord) a manufacturer of custom wood and metal fixtures, for reducing solvent use by 65 per cent, paint sludges by 85 per cent and volatile organic compounds (VOCs) by 120,000 kilograms a year, lowering energy consumption and reducing the amount of solid waste going to landfill.

◆ Leadership:

Pollution Probe (Toronto) an environmental public interest group, for advocating pollution prevention concepts for many years and aggressively incorporating this position into many of its activities.

1994

◆ Small facility:

Davlin Cleaners (Etobicoke) for using a water-based Clean and Green System to eliminate the use of approximately 8,500 litres of perchloroethylene a year. In addition, the company was able to cut the amount of Stoddard solvent used in dry cleaning by 50 per cent and dyes by 10 per cent, the generation of hazardous wastes by 50 per cent, other pollutants by 20 per cent and energy consumption by 30 per cent.

◆ Medium facilities:

Elf Altochem Canada Inc. (Oakville) a manufacturer and marketer of

chemical and lubricant products, for ensuring that its employees were trained to effectively recycle materials, conserve water and energy, and minimize the environmental effects of chemical spills and emissions. And **Strataflex Canada Corp.** (East York) a manufacturer of flexible circuit boards used in the computer, aerospace, telecommunications and defence industries, for committing itself to a zero-haul-away policy and to the treatment of wastes in-house by the end of 1994.

◆ Large facility:

Xerox Canada (Toronto) for eliminating the use of 140 kilograms of methylene chloride, replacing its ozone-depleting substances with more environmentally friendly products and beginning the in-house recycling of waste solder, collected from the cleaning/resoldering of circuit boards.

◆ Leadership:

The **Hamilton District Autobody Repair Association** for reaching more than 300 automotive repair businesses in the Golden Horseshoe through workshops, newsletters and information packages. HARA kept its members informed about legislation pertaining to auto body shops and showed them how to increase profits while reducing emissions of solvents and VOCs to the environment.

1995

◆ Small facility:

Kelly Auto Body (1989) Ltd. (Hamilton) for achieving an 80 per cent reduction in washing

solvent wastes.

◆ **Medium facilities:**

Careful Hand Laundry and Dry Cleaners Ltd. (Toronto) for achieving a 42 per cent reduction in the use of perchloroethylene, and the **Guelph Utility Pole Co. Ltd.** (Guelph) for reducing waste pentachlorophenol by 99 per cent.

◆ **Large facility:**

Lennox Industries (Canada) Ltd.

(Etobicoke) for eliminating the use of adhesives containing 1,1,1-trichlorethane and achieving a 50 per cent reduction in the use of 17 aerosol solvents, lubricants and spray paints.

◆ **Leadership:**

The **Motor Vehicle Manufacturers' Association** for entering into the first industry/federal/provincial pollution prevention agreement in Canada. At the time of the awards ceremony, it had reported a reduction of 3,960 tonnes of toxic substances and other wastes, accomplished through 42 pollution prevention projects at 13 participating facilities.

1996

◆ **Small facility:**

Finchdale Cleaners (Weston) for converting a major part of its business to a wet cleaning process, and as a result reducing the generation of hazardous wastes, including perchloroethylene, by 75 per cent during the previous two years.

◆ **Medium facility:**

Huntsman Corporation Canada Inc. (Guelph) for reducing ethylene

oxide emissions by 99 per cent.

◆ **Large facility:**

Du Pont Canada Inc. (Maitland) for reducing fibre wastes and its discharges and emissions of adipic and nitric acid, carbon tetrachloride, tetrachloroethylene, cyclohexane, naphthalene, hexamethyleneimine, bis(hexamethylene)-triamine, alumina, carbon dioxide and nitrous oxides.

◆ **Leadership:**

The **Canadian Division of the Photo Marketing Association International** for developing, implementing and promoting a voluntary environmental code of management practice which led to reductions in discharges of silver and other chemicals into the environment. PMA worked with suppliers and photo processing mini-lab operators to establish training courses on the code, and promoted use of the code elsewhere in North America.

1997

◆ **Small facility:**

Canadian Auto Collision (Brantford) for reducing solvent wastes and VOC and dust emissions.

◆ **Medium facility:**

3M Canada – Scotchbright Manufacturing Facility (Perth) for decreasing VOC emissions by 244 tonnes per year by using water-based chemistry in the production of non-woven abrasive products.

◆ **Large facility:**

Tenneco Automotive (Owen Sound) for realizing an 80 per cent reduction in annual hazardous waste

generation through the collection and reuse of paints, acids and grinder swarf wastes.

◆ **Leadership:**

Ontario Farm Environmental Coalition

(Toronto) for developing and promoting the Environmental Farm Plan, establishing work groups on environmental management systems, and training approximately 10,000 Ontario farmers.

1998

◆ **Small facility:**

Container Services A.R.M. (Colborne)

for installing a closed loop water recycling system, reducing the use of sodium hydroxide by over 50,000 litres a year and eliminating 100 per cent of its sewer discharge.

◆ **Medium facility:**

427 Auto Collision (Toronto) for reducing VOCs by 2,000 litres a year using high-volume/low-pressure or low-volume/low-pressure spray guns, and for reducing solvents by 5,000 litres a year through on-site recycling projects.

◆ **Large facility:**

Kuntz Electroplating (Kitchener) for implementing a unique Cyanide Hydrolysis System to replace cyanide destruction methods, reducing chemical usage by over 84,000 litres a year.

◆ **Leadership:**

Emery Creek Environmental Association

(Weston) for creating a business-to-business support network dedicated to pollution reduction within the Emery Creek Watershed.

1999

◆ **Small facility:**

Hawley Pontiac Buick Cadillac Ltd.

(Mississauga) for replacing older spray guns with more efficient HVLP (high volume/low-pressure) guns, using an automated spray gun washer which filters and reuses spent solvent, and using low-VOC non-isocyanate primer and a liquid mask product.

◆ **Medium facility:**

Xerox Canada Ltd. Oakville Colour Toner Plant

(Oakville) for using a membrane filter system to collect toner from cleaning solutions for reuse (a 50 per cent waste reduction) and for recovering toner fines from the grinding process for reprocessing (a 47 per cent waste reduction).

◆ **Large facility:**

Marconi Communications Canada Inc.

(St. Thomas) for eliminating VOCs from its operations by switching from liquid-based to powder-based paint and retrofitting a wave solder machine from a foam fluxer to accommodate the use of VOC-free, aqueous-based flux.

◆ **Leadership:**

Canadian Centre for Pollution Prevention

(Sarnia) for dedication to promoting pollution prevention as the strategy of choice for protecting the environment through active involvement in developing and facilitating pollution prevention workshops and conferences and establishing information resources on behalf of local, provincial and national organizations.

3. Education, training and tools

Education and training

While pollution prevention and environmental management systems offer clear and quantifiable benefits, they can be new concepts to many. Education and training are needed to develop the required knowledge and skills in those planning or implementing pollution prevention initiatives.

There are four levels of education and training: (1) *awareness training*, (2) *practical tools training*, (3) *hands-on, how-to training*, and (4) *train-the-trainer training*. Here are brief descriptions of what each level involves.

(1) Awareness training sessions are used to promote the principles and underlying theories of pollution prevention. At this first stage, benefits such as cost avoidance, improved environmental performance and due diligence are emphasized.

(2) The practical tools sessions provide a more comprehensive discussion of the concepts that can be used to achieve pollution prevention goals. Participants learn how to assess and deal with their organization's environmental priorities using essential tools such as pollution prevention planning and problem solving methods. Sector-specific instructional tools, such as guidebooks and codes of practice, are developed and used to make the

adoption of pollution prevention easier.

(3) Hands-on, how-to workshops go beyond the concepts stage and provide sufficient in-depth training to allow the participants to implement pollution prevention and environmental management planning in their own workplaces (Best Practices). These workshops may entail a tour of a facility which has pollution prevention projects in place. After a walk through of the plant, the participants may follow up with questions about project implementation, including specific challenges and costs.

(4) Train-the-trainer sessions are designed to train individuals who will return to their facilities and provide awareness, practical tools and hands-on workshops for their colleagues. These train-the-trainer sessions are tailored for individuals who have already received instruction in the concepts, theory and application of pollution prevention.

The MOE participates in the development and/or delivery of numerous such programs.

Educational and training activities are routinely provided to six different client groups:

- ◆ business and industry partners
- ◆ municipal and community groups
- ◆ educational institutions
- ◆ conferences and workshops

- ◆ international forums
- ◆ internal ministry staff.

Here are some illustrative examples of educational and training workshops for each client group:

Business and industry partners

- ◆ At the North American Auto Supplier Environmental Workshop, more than 300 participants from the U.S. and Canada attended presentations on environmental management systems (based on ISO 14000), clean production, alternative regulatory approaches and design for the environment.
- ◆ Ten seminars to inform printers about pollution prevention opportunities and to encourage the use of a checklist guide-book were held at eight locations in southern Ontario, attended by 127 printers and over 50 suppliers.
- ◆ The Automobile Parts Manufacturers' Association has hosted several training sessions concerning environmental management systems, pollution prevention and risk analysis. These sessions averaged about 30 participants per session. Annual Metal Finishing Pollution Prevention Workshops are held for industry representatives.
- ◆ An Auto Profitability Workshop, organized by the Hamilton District Autobody Repair Association and delivered in partnership with the MOE, is

being presented to members of various auto repair associations to promote the principles of pollution prevention.

Municipal and community groups

- ◆ Presentations to promote opportunities for pollution prevention in the Great Lakes Areas of Concern were made to Remedial Action Plan (RAP) committees and coordinator workshops in Hamilton, Collingwood and the Bay of Quinte area.
- ◆ The Windsor Air Quality Committee held a pollution prevention seminar to promote pollution prevention with local industry.
- ◆ The London Chamber of Commerce hosted a special session on pollution prevention at a workshop of the Environmental Management Resource Centre for Business in London.
- ◆ The City of Hamilton held pollution prevention workshops to share its successes and experiences with other municipal governments and industry.

Educational institutions

- ◆ The Ontario Environmental Training Consortium in Niagara Falls invited the ministry to describe some of the opportunities associated with pollution prevention at a conference for college teachers.
- ◆ The University of Toronto arranged for government and

industry experts to give lectures on pollution prevention and environmental management systems to graduate students.

Conferences and workshops

- ◆ The Canadian Environmental Technologies (CETECH) Conference featured case study presentations on pollution prevention techniques and training for shop floor staff in manufacturing plants.
- ◆ The Environment and Energy Conference of Ontario (EECO) has featured sessions on environmental management systems and green chemicals. One recent theme was *Solutions that Don't Cost the Earth*.
- ◆ The MOE sponsored an industrial ecology workshop for consultants, academics, and representatives from industry, various service sectors and government.
- ◆ Pollution Probe and the Conference Board of Canada hosted a conference entitled Voluntary Initiatives: Policy Framework and Roles. This meeting was a culmination of research from the Conference Board's Innovators in Environmental Action Forum (IEAF) and Pollution Probe's *Towards Credible and Effective Environmental Voluntary Initiatives: Lessons Learned*, a detailed review of voluntary initiatives from across the country.

- ◆ The Canadian Petroleum Products Institute (CPPI) sponsored a pollution prevention workshop to promote prevention principles and practices among its members. Results of this workshop have been summarized in the CPPI's First Environmental Performance Review, which outlines the organization's environmental position and highlights future prevention activities within the industry.

International forums

- ◆ The World Wildlife Fund organized a one-day Roundtable on Pollution Prevention for Indirect Dischargers, with representatives from Ontario, Quebec, and the U.S., including MOE staff and environmental groups.
- ◆ A biannual meeting of the Great Lakes Pollution Prevention Roundtable, held in Sarnia, featured updates on the pollution prevention activities of the U.S. and Canadian federal governments, and included a special section on Ontario's efforts.
- ◆ The Canadian Environment Industry Association (CEIA) organized the 17th annual Canadian Waste Management Conference held in Quebec City. More than 300 representatives from all 10 provinces and several countries discussed new solutions for waste minimization, including voluntary industry/government pollution prevention partnerships.

- ◆ The Canadian Pollution Prevention Roundtable is a high-profile forum for sharing key successes in pollution prevention from across Canada. The next meeting will be held in St. John's, Newfoundland on June 6 to 8, 2001 with a focus on pollution prevention planning, with sessions discussing effective approaches to stimulate further action on pollution prevention.
- ◆ Last year, Montreal played host to two important meetings, organized by the Canadian Centre for Pollution Prevention, Environment Canada, and the United Nations:
- ◆ Senior decision makers from around the world met to discuss the current status and future direction of cleaner production at the United Nations Environment Program's (UNEP) Sixth International High Level Seminar on Cleaner Production.
- ◆ Leading practitioners and representatives from Pollution Prevention Roundtables met to strengthen partnerships and stimulate further direction on pollution prevention at the International Pollution Prevention Summit.
- ◆ A series of awareness-raising, interactive training sessions on ISO 14000 were held for MOE front line and management staff. The training focused on ISO 14000 as it applies to small and medium-sized businesses.
- ◆ A series of half-day pollution prevention workshops was delivered to more than 95 regional staff from seven MOE offices.
- ◆ A two-day Green Industry Training Course featured sessions on environmental management systems, ISO 14000 and pollution prevention.

Tools

Internal ministry staff

- ◆ A mining course for environmental officers, held in Timmins, featured a presentation on the MOE's pollution prevention strategy and programs.
- ◆ Pollution prevention guidebooks, environmental management systems, case studies, videos and codes of management practice all can be used to aid client groups. Many of these tools have been developed through pollution prevention partnerships and are targeted to the needs of a specific industrial or commercial sector. Others are generic and have more general applications. Here are a few examples:
- ◆ *Pollution Prevention Planning – Guidance Document and Workbook* (1995) is a general pollution prevention planning guide for business.
- ◆ *A Strategy to Fulfill the CCME Commitment to Pollution*

Prevention (1996) offers vision, mission, goals and common definitions for governments across the country.

- ◆ *Environmental Code of Management Practice for Mini-labs* (1994) provides a management system under which photo processing mini-lab owners and operators can reduce waste and water consumption, minimize silver discharges to sewers and prevent spills and poor operating practices.
- ◆ *Metal Finishing Pollution Prevention Guide* (1995) is a hands-on, how-to pollution prevention guide for metal finishers.
- ◆ *Environmental Code of Management Practice for Laundry Operations* (1996) is a management system for laundry operations to identify opportunities to reduce waste and prevent discharges to the environment.
- ◆ *Pollution Prevention for the Printing and Graphics Sector* (1994) is a video used at printing and graphics trade shows to promote pollution prevention.
- ◆ *Rethink Pollution – Prevention Pays* (1995) is an introductory video on pollution prevention, used for general awareness-raising workshops.
- ◆ *Guide to Pollution Prevention for Municipalities* (published by the Regional Municipality of Hamilton-Wentworth in 1996) is a pollution prevention guide that can be used by other municipalities and agencies.
- ◆ *Guidebook for Printing and Graphics Industry* is a planning tool to help printers establish environmental management systems and provide more detailed advice on environmental compliance and pollution prevention techniques.

4. Leadership initiatives

The following initiatives illustrate efforts by the ministry and others to achieve the goal of integrating the principles of pollution prevention and environmental management with other tools of environmental protection:

Clean Air Hamilton

The formation of the Clean Air Hamilton Committee, as well as two other committees, is the second phase of this initiative.

The first phase of the project involved evaluating and prioritizing the health effects of the airborne pollutants in the Hamilton area. It was found that inhalable particulates were the most harmful air pollutant in the region. The committee has been working on implementing pollution control programs to reduce particulate emissions. As a result of this initiative, by 1997, inhalable air particulates had decreased by 20 per cent over 1991 levels.

For the year 2000, Clean Air Hamilton won a Dubai/United Nations International Award for Best Practices to Improve the Living Environment. The award recognized Hamilton's clean air initiatives as part of one of the top 10 strategies from around the world for improving a community's environment, economy and overall quality of life.

The Clean Air Hamilton Committee and three subcommittees

related to the initiative continue with a high level of co-operation and participation from major stakeholders. These primary stakeholders include all three levels of government, local industries, local environmental groups and consultants, McMaster University and Mohawk College.

Clean Marine Partnership

The Clean Marine Partnership (CMP) was created as an alternative to regulating the boating industry. The partnership is designed to encourage the environmental improvement of boating practices through public education. Among its accomplishments rank the production and distribution of the Clean Marine Partnership Handbook (April, 1997) to nearly 1,000 marinas and yacht clubs in Ontario. More than 100 marina professionals have received training in implementing clean operating practices, and efforts within the last three years have led to nine manufacturers receiving Ecologo Certification for 45 marine products.

Clean Production Activities

The Clean Production Activities Program focuses on providing expert advice, support tools and other assistance to Ontario industries. These services are provided to help develop and implement

MOE's Clean Marine partners include:

- ◆ Canadian Marine Manufacturers Association
- ◆ Canadian Power and Sail Squadrons
- ◆ Ontario Boating Forum
- ◆ Ontario Marine Operators Association
- ◆ Ontario Sailing Association
- ◆ Environment Canada
- ◆ Environmental Choice Program
- ◆ Georgian College

plans for energy and resource conservation, and to assist clients in the promotion and acceptance of innovations in environmental technology.

Under this program, the ministry has profiled:

- ◆ 30 environmental technology programs
- ◆ 15 green industrial analyses
- ◆ 11 green industrial retrofits
- ◆ 2 industrial energy retrofits
- ◆ 1 industrial energy feasibility study

Climate Change Voluntary Challenge Registry Program

Voluntary Challenge Registry (VCR) Inc. is a not-for-profit corporation dedicated to encouraging private and public sector organizations to voluntarily limit their net greenhouse gas emissions, as a step toward meeting Canada's climate change goals. The VCR participation rate has risen steadily since the program's inception in late 1994. To date, more than 900 organizations from all sectors of the economy have joined the initiative, including the federal government and all provincial governments. There are 342 VCR participants in Ontario.

In 1997, the VCR completed its transition from a government incubated program to a stand-alone private-public partnership. In November 1996, Ontario committed to reducing greenhouse gas emissions from government operations by 40 per cent measured

against a 1990 baseline. Ontario still expects to meet its target when final results are reported.

In June 1998, the registry database was replaced with a much improved and very well received document retrieval system. In April 1999, a new on-line registration system was introduced, facilitating registration and registrant profile updating. Recently, VCR has changed to a more rigorous participation system. The total number of GHG action plans posted on the Challenge Registry has doubled between 1997 and 2000 to 757 with almost half of those being followed up with regular progress reporting.

The Minister of the Environment and the Minister of Energy, Science and Technology continue to support voluntary reporting and commitments through VCR, and encourage full participation by all sectors.

Emery Creek Environmental Association Partnership

Since 1997, the Emery Creek Environmental Association (ECEA) has extended its outreach into the local community in the Weston area of Toronto. Five issues of the *Journal of Pollution Prevention* have been published, featuring 18 local business success stories. The ECEA has been working with Gulfstream School, holding annual Earth Day Clean Ups, Fall Clean Ups and tree plantings with students.

The ECEA holds regular semi-

Recent awards won by the Emery Creek Environmental Association:

1997

Environmental Citizenship Award, federal Minister of the Environment

1998

Toronto Remedial Action Plan Award of Excellence

1998

MOE Pollution Prevention Pledge Program Leadership Award

A health-care case study

Baxter Corp. Alliston, Ontario

Baxter Corp. is a leading international manufacturer of health-care products. An MOE-supported environment and energy analysis helped the company set priorities and plan new "green" projects. Among the recommendations made, the assessment identified several opportunities for reductions in material input and waste generation. Through the reuse of process water and the separation of waste streams, the company can achieve savings of 7 per cent in electrical energy and 40 per cent in water use.

Past sponsors of EECO have included:

Alliance of Manufacturers & Exporters Canada

Air & Waste Management Association – Ontario Section

Automotive Parts Manufacturers' Association

Canadian Environment Industry Association – Ontario

Environment Canada

Industry Canada

Ontario Natural Gas Association

nars on environmental topics of interest to local businesses and residents. Community seminars on composting and household hazardous wastes were held in 1998 as well as a business seminar on the National Pollutant Reporting Inventory.

The ECEA worked with the MOE and the Canadian Centre for Pollution Prevention to create a Guidance Document for ISO and Environmental Management Systems. The guide contains case studies from Emery Creek businesses.

The ECEA has been an active participant at the Canadian Pollution Prevention Roundtables held in 1997, 1998 and 1999. Over the next few years the association will continue to expand its range of educational seminars, workshops and training and continue to support the community through schools and other local groups.

Visit the Emery Creek Environmental Association Web site at www.interlog.com/~emery.

Environment and Energy Conference of Ontario

The annual Environment and Energy Conference of Ontario (EECO) promotes opportunities for industry, non-governmental groups and individuals to network and discover new approaches and technologies for resource conservation and pollution prevention. EECO is the largest conference in the province that focuses on the

business of the environment and energy.

EECO has been attended by over 600 delegates annually. Sessions have covered such topics as regulatory reform, new government directions, environmental management systems and business development.

The 1996 conference, *Fast Forward 2000*, focused on equipping businesses for the challenges of the 21st century. At the 1997 conference, *Winning in the New Environment: Successful Strategies for Managing Change*, the Canadian Business Environmental Performance Office (CBEPO) was launched. This unique virtual office was developed by industry associations, institutions and government to provide Internet-based information that would allow small and medium sized businesses to improve their environmental performance. At EECO 1998, under the theme of *Solutions that Don't Cost the Earth*, 12 businesses were recognized for successfully completing the Group ISO 14001 Implementation Program.

The ministry has recently entered into a new partnership with The Globe Foundation on a new environment and energy conference, which was held for the first time in January 2001. The goal is to make this conference and trade show the premier event of its type in North America servicing the Great Lakes area markets.

Enviro-Net: Pollution Prevention for the Healthcare Sector

The Healthcare Enviro-Net is a Web site developed with funding from Environment Canada (EC) and the MOE, in consultation with healthcare and non-governmental organizations. It grew out of a joint MOE-EC Ontario-wide pollution prevention initiative which provided training in pollution prevention for staff employed in the health care sector.

The goal of the Web site is to provide the health care community with access to up-to-date environmental information and materials on products and services that support delivery of high-quality health care while promoting pollution prevention and environmentally sustainable development.

The Web site also provides an electronic newsletter, regulatory updates, links to other useful pollution prevention and health sites, and information on upcoming conferences and training, environmental issues in health care, and environmental management and accreditation. You can access the Healthcare Enviro-Net Web site at www.e2p2online.com.

Green Industry Strategy

Through its Green Industry function, the MOE supports the growth of Ontario's environment industry. By helping Ontario environmental companies achieve a higher growth rate, the ministry has helped to expand the environ-

ment industry sector, a key component in meeting provincial environmental protection goals.

MOE's international activities have helped numerous companies identify and/or secure a total of \$200 million of new export business. A stronger environment industry helps to meet environmental challenges in local, cross-boundary and global arenas.

Over 6,000 copies of the 1998/99 Ontario Environment Business Directory have been distributed in domestic and international markets.

The directory is now available in electronic format via www.envirodirectory.on.ca.

Hamilton District Autobody Repair Association Partnership

The Hamilton District Autobody Repair Association (HARA) has been expanding and communicating the pollution prevention message to its members and to autobody shops throughout Ontario. In 1994, HARA won the Pollution Prevention Leadership Award for advocating that members reduce the use of solvents and encouraging them to switch to high-volume/low-pressure paint spray guns. Since then, HARA has widened its focus, cooperating with other autobody associations in surrounding areas to promote pollution prevention. HARA has co-ordinated a series of workshops and seminars with similar associations in London, Sarnia, Toronto, Oshawa, Waterloo and

P2 success at autobody shop

In 1996, Dundas Valley Collision was recognized by the Pollution Prevention Pledge Program for its pollution prevention initiative, which covered the installation of a solvent recovery unit, the use of high-volume/low-pressure spray guns and an enclosed gun washer. Through this strategy, the company reduced solvent wastes from 1,620 litres in 1995 to 608 litres in 1996, saving \$815 a year in disposal fees. Through its on-site solvent recovery and reuse, the company reduced solvent purchase costs by \$1,295 a year. Total operating cost savings recovered the pollution prevention capital costs within the first year of operation and now generate annual profit.

St. Catharines. These workshops have been well received by auto-body shops all over the province. An MOU is currently being negotiated with the autobody refinishing sector that will include 3-5 year emission reduction targets, which will contribute to meeting the ASAP goal of 45 per cent reduction in VOCs emissions by 2015.

The MOU will also include the development and delivery of pollution prevention and resource conservation training to nearly 2,000 autobody shops across the province. Discussions are underway with the Ministry of Training, Colleges and Universities to deliver the training through the community college system using latest Internet-based interactive learning technology.

Lake Superior Bi-National Program

Several community-level initiatives to target mercury reduction have been undertaken by EcoSuperior, an organization devoted to pollution prevention in Thunder Bay and the surrounding area. These efforts are supported by the Great Lakes Renewal Foundation, the MOE and Environment Canada, and by community partnerships with the City of Thunder Bay and local companies from Thunder Bay to Sault Ste. Marie.

Some of the current initiatives:

- ◆ A thermostat recycling project collects and recycles standard residential mercury-switch

thermostats that have been removed from use, and button battery recycling, from Thunder Bay to Sault Ste. Marie, continues to reduce the number of mercury-containing batteries that end up in landfill sites.

- ◆ A fluorescent lamp recycling program for institutions, the commercial sector and industry has been established to reduce the number of lamps containing mercury being sent to landfill.
- ◆ Newsletters, a Web page (www.ecosuperior.com) and other material made available to the media distributes information about successful pollution prevention efforts.

Partners In Air

Partners in Air (PIA) is a partnership between government, industries and students that provides hands-on experience to senior level high school students (Grade 10 through OAC) in air quality monitoring, sample collection and analysis. The goal of the program is to heighten awareness of air quality issues and to provide students with direct training in scientific methods and applications. To date, 14 schools across Ontario have joined the PIA initiative, along with six corporate sponsors: Dofasco Inc., Shell Canada Limited, General Motors of Canada Limited, Petro-Canada, Ontario Power Generation Inc. and St. Lawrence Cement Inc.

PIA is a multi-disciplinary

Partners in Air acknowledges the following corporate sponsors:

Dofasco Inc.

Shell Canada Limited

General Motors of Canada
Limited

Petro-Canada

St. Lawrence Cement Inc.

Ontario Power Generation Inc.



program. Students learn about the chemistry, geography, math, biology and physics of air pollution and air quality protection. A curriculum unit provides students with in-class instruction, laboratory experiments, resource materials and projects that profile air pollution issues. An Independent Study Unit or Science Club component is included, involving long-term sample collection and testing. Students study air quality and meteorological monitoring. They learn to monitor ozone, particulates, metals, oxides of sulphur and other parameters and to make the links between human activity, weather and air pollution. Students can now also learn from a PIA Web site, and can download air quality and meteorological monitoring data and discuss their findings with students across the province.

The Partners in Air Web site can be found at www.partnersinair.org.

Pollution Probe's Mercury Elimination and Reduction Challenge

Pollution Probe continues to expand the work of its Mercury Elimination and Reduction Challenge (MERC) Program with extensive research undertaken over the past year on mercury use in electrical products. Funding for the MERC Program is provided by the Ministry of the Environment, Environment Canada, the Commission for Environmental Cooperation, and the Salamander

Foundation. Ontario has formed a partnership with Pollution Probe and local hospitals to eliminate mercury use in the healthcare sector, and negotiations are underway with dentists on reducing mercury emissions from dental practices.

Other mercury reduction processes the ministry is involved in include: the Canada-Wide Standards for Mercury set by the Canadian Council of Ministers of the Environment, the Binational Toxics Strategy, and the Canada-Ontario Agreement – Ontario Mercury Action Plan. The ministry will also be involved in implementing the Commission for Environmental Cooperation's Phase II North American Regional Action Plan (NARAP) for Mercury.

Mercury emissions have been reduced by 73 per cent since 1988, and new standards should raise this reduction to 81 per cent by 2006.

Remedial Action Plan Program

The Ministry of the Environment is committed to working toward cleaner and healthier Great Lakes in the year 2001 and beyond. The Remedial Action Plan (RAP) program focuses not only on rehabilitating degraded ecosystems, but also on protecting and sustaining the improvements through pollution prevention and source control. In keeping with the Great Lakes Water Quality Agreement, RAPs strive for virtual elimination of persistent toxic substances.

The following schools are participating in Partners in Air:

A.B. Lucas Secondary School
London, Ontario

Birchmount Collegiate Institute
Toronto, Ontario

Cobourg District Collegiate
Institute West
Cobourg, Ontario

Hammarskjöld High School
Thunder Bay, Ontario

Huntsville High School
Huntsville, Ontario

Lorne Park Secondary School
Mississauga, Ontario

Monsignor Percy Johnson
Secondary School
Rexdale, Ontario

Northern Collegiate Institute
Sarnia, Ontario

Riverside Secondary School
Windsor, Ontario

Sir Allan MacNabb
Secondary School
Hamilton, Ontario

St. Thomas Aquinas
Secondary School
Oakville, Ontario

Sudbury Secondary School
Sudbury, Ontario

West Carleton High School
Dunrobin, Ontario

Widdifield Secondary School
North Bay, Ontario

Several of the RAP communities are members of the Green Communities Network.

Since 1997, the province has made specific commitments of \$29 million to projects in Remedial Action Plan areas through the Provincial Water Protection Fund. Ontario's RAPs have made a significant contribution to cleaning up the Great Lakes. The province has so far invested over \$300 million in Great Lakes areas of concern, and there have been some notable improvements.

Among the highlights: Collingwood Harbour was delisted as an area of concern, and Spanish Harbour, Jackfish Bay, Peninsula Harbour, Nipigon Bay and Wheatley Harbour are well on their way to restored environmental quality. Among the Great Lakes, successes include improved fish and wildlife habitat and populations.

Four species of fish which had almost vanished from Lake Ontario – lake trout, lake sturgeon, lake herring (cisco) and deepwater sculpin – have reappeared, and there has been a decline in PCB levels in salmon and trout.

Thanks to dramatic declines in the amount of DDT and PCBs in Lake Ontario, herring gull populations have fully recovered from reproductive problems, and bald eagle populations in the Lake Ontario Basin are increasing at an annual rate of 15 to 30 per cent.

There has been an overall recovery of native fish species in Lake Superior, including a naturally reproducing population of lake trout. The lake trout fishery has also recovered in the Parry Sound area of Lake Huron (Georgian Bay).

In the Niagara River, there are now less restrictive consumption advisories for trout and salmon, and PCB concentrations in juvenile fish are now below the objective limit under the Great Lakes Water Quality Agreement. At Niagara-on-the Lake, PCB concentrations have dropped below the Agreement's objective limit for the protection of fish-eating wildlife, and the decreased concentration in spottail shiners has been particularly dramatic.

Anti-Smog Action Plan (ASAP)

Ontario's Anti-Smog Action Plan unites close to 200 representatives from government, industry, academia, municipalities and environment, health and community groups in a voluntary commitment to reduce smog-causing emissions.

The Anti-Smog Action Plan's target is a 45 per cent reduction of smog-causing emissions, based on 1990 emission levels, by 2015. The ASAP also includes a commitment to develop an Ontario particulate strategy – with an interim reduction target for fine particulate matter set at a minimum of 10 per cent.

To date, activities have been

identified, planned or implemented that would result in emissions reductions of 242,000 tonnes for nitrogen oxides (NOx) and 228,000 tonnes for volatile organic compounds (VOCs). This represents 80 per cent and 60 per cent, respectively, of the emissions reduction targets set for NOx and VOCs. Further opportunities and actions are being identified by a team of stakeholders from industry, non-governmental organizations, environment ministry staff and other levels of government.

Notable achievements include:

- ◆ Ontario's Drive Clean Program, which is on track to reach its goal of reducing smog-causing emissions from vehicles in the program area by 22 per cent.
- ◆ the Pilot Emission Reduction Trading project (PERT);
- ◆ a regulated requirement for gasoline vapour recovery in gasoline distribution systems, which will eliminate 19,000 tonnes of smog-causing emissions a year;
- ◆ industry projects such as upgrading the efficiency of boilers and heaters, controls on storage tanks, and solvent and paint management, which are expected to reduce emissions of NOx and VOCs by 40,000 tonnes a year;
- ◆ the proposed environmental protection framework for Ontario's future competitive electricity market, including sector-wide emissions limits on NOx and SO₂, a proposed requirement for the Lakeview Generating Station to cease burning coal by 2005 and the release of a discussion paper on emissions reduction trading.
- ◆ the Air Quality Ontario Initiative, centred around an upgraded smog alert system and a new Web site (www.airquality-ontario.com) that provides early, improved air quality forecasts and information on actions that can be taken in the event of a smog alert.
- ◆ over \$4 million in upgrades to the provincial air quality monitoring network, making it one of the most modern and best-equipped in North America;
- ◆ a Smog Alert Response Program that provides proactive direction to municipalities, industry and the general public on how to respond to smog alerts.
- ◆ the Ontario Government successfully intervened in a U.S. Supreme Court decision that will help reduce pollution coming into Ontario from the Midwestern U.S. Over 50 per cent of Ontario's smog originates in the United States.

Resource conservation sector guides

Sector guides and protocols help industries to identify ways they can conserve resources and reduce environmental discharges.

Some industry and manufacturing groups that are part of Ontario's Anti-Smog Action Plan:

- ◆ **NO_x and VOC emissions**
 - Iron and steel
 - Chemicals
 - Petroleum
- ◆ **Surface coating emissions**
 - Automobile manufacturing
 - Automotive refinishing
 - Wood products
- ◆ **Consumer coatings**
 - Cans/metal packaging
 - Metal finishing
- ◆ **General solvent use**
 - Printing and Graphics
 - Plastics processing
 - Degreasing
 - Pesticide formulation
 - Rubber production

The development of sector guides has led to ongoing co-operation and partnership between the Ministry of the Environment and industry associations or industrial clients.

To date, several general guides have been published, including: *ISO 14000 Guidance Document for a Business Community – Environmental Management Systems*; *Environmental Performance and Competitive Advantage: A Business Guide*; and *Applying Sustainable Development to Business – Realizing the Benefits*.

Many other guides to resource conservation and cost savings opportunities have been written for specific sectors including:

- ◆ automotive parts manufacturing sector
- ◆ food services sector
- ◆ dairy processing sector
- ◆ municipal water and wastewater sector
- ◆ plastics processing and reprocessing sectors
- ◆ soaps, detergents and related products sector
- ◆ adhesives, paints and coatings sector
- ◆ meat and poultry sector (updated July 1999)
- ◆ office buildings.

Toronto Air Initiative

The Toronto Air Initiative began in 1997 and is one of several activities the MOE's Toronto

District Office is undertaking to address air quality issues. For the last four years, the Toronto Air Initiative has had three primary goals: *produce tangible air abatement results*; *advance our understanding of air quality issues in Toronto*; and *develop partnerships to improve air quality and encourage public awareness*. Projects have included abatement inspections, linkage with scientific staff of the Environmental Monitoring and Reporting Branch, and improving awareness and promoting partnerships with organizations representing the dry cleaning and autobody sectors.

In 2000/01, the Toronto Air Initiative built upon the success of past efforts. Some projects:

- ◆ auditing compliance with Ontario Regulation 346 regarding air emissions;
- ◆ developing a community-based approach to reduce total loadings of air contaminants to the natural environment.
- ◆ continuing with partnership and outreach efforts with the autobody repair sector.

Not just in Ontario...

The Ministry of the Environment continues to work with external organizations and governments to promote consistent and coordinated approaches to pollution prevention among jurisdictions, and to share information and lessons learned.

Environment Canada is one of the ministry's key partners in most of

our Memorandums of Understanding with industry sectors. Municipal governments, such as the City of Hamilton, work closely with the ministry in pollution prevention initiatives. The ministry also has close working ties to the Canadian Council of Ministers of the Environment, the Canadian Centre for Pollution Prevention and the United States Environmental Protection Agency.

Intergovernmental panels and activities related to pollution prevention in which the ministry takes part include both the U.S. and the Canadian Annual Pollution Prevention Roundtables, as well as the Great Lakes Pollution Prevention Roundtable. The Ministry of the Environment also contributes to other pollution prevention information-sharing initiatives, including Pollution Probe's Towards Credible and Effective Voluntary Initiatives Steering Committee, the Accelerated Reduction and Elimination of Toxics (ARET) Stakeholders Committee, and the Innovators in Environmental Action Conference Board of Canada Steering Committee. Through these external, multi-stakeholder groups, the ministry is able to learn and share, which helps create the best possible tools and methodology to effect environmental improvement.

Pollution prevention on the Web

Alliance for Environmental Technology

<http://VirtualOffice.ic.gc.ca>

Canadian Centre for Pollution Prevention

<http://www.c2p2online.com>

Canadian Pollution Prevention Information Clearinghouse

<http://www3.ec.gc.ca/cppic>

Emery Creek Environmental Association

<http://www.interlog.com/~emery>

Environment Canada

<http://www.ec.gc.ca>

Environmental Bill of Rights

http://www.ene.gov.on.ca/envision/env_reg/ebr/

Environmental Commissioner of Ontario

<http://www.eco.on.ca>

Great Lakes Regional Pollution Prevention Roundtable

<http://www.glrppr.uiuc.edu>

Healthcare Enviro-Net

[via:www.c2p2online.com](http://www.c2p2online.com)

International Institute for Sustainable Development (IISD)

<http://iisd1.iisd.ca/business/journey.htm>

Ontario Environment Business Directory

<http://www.envirodirectory.on.ca>

Ontario Ministry of the Environment

<http://www.ene.gov.on.ca>

<http://www.airqualityontario.com>

Pollution Prevention for Printers

<http://www.cleanprint.org>

Partners in Air

<http://www.partnersinair.org>

Virtual Office – Ontario

<http://VirtualOffice.ic.gc.ca>

Water Environment Association of Ontario

<http://www.weao.org/index.htm>

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